

Amendment and Response- Under 37 C.F.R. §1.116 - Expedited Examining Procedure

Page 2 of 8

Serial No.: 09/560,268

Confirmation No.: 2517

Filed: April 26, 2000

For: COMPOSITIONS FOR SELECTIVELY ETCHING AGAINST COBALT SILICIDE (As Amended)

### Amendments to the Claims

This listing of claims replaces all prior versions, and listings, of claims in the above-identified application:

### Listing of Claims

1-63. Canceled

64. **(Currently Amended)** An etching composition, the composition comprising a mineral acid, a peroxide, and deionized water at a ratio in a range of about 1:1:25 (mineral acid:peroxide:deionized water) to about 1:1:15 (mineral acid:peroxide:deionized water), wherein the composition has an etch rate greater than about 1000 Å/minute for cobalt at a temperature in a range of about 20 degrees centigrade to about 100 degrees centigrade and an etch rate of about 50 Å/minute to about 250 Å/minute for metal nitride at a temperature in a range of about 20 degrees centigrade to about 100 degrees centigrade.

65. **(Previously Presented)** The etching composition according to claim 64, wherein the mineral acid is HCl and the peroxide is hydrogen peroxide.

66. Canceled

67. **(Previously Presented)** The etching composition according to claim 64, wherein the mineral acid is selected from the group consisting of HCl, HNO<sub>3</sub>, H<sub>2</sub>SO<sub>4</sub>, H<sub>3</sub>PO<sub>4</sub>, and HF.

68. **(Previously Presented)** An etching composition, the composition comprising a mineral acid, a peroxide, and deionized water at a ratio in a range of about 1:1:35 (mineral acid:peroxide:deionized water) to about 1:1:15 (mineral acid:peroxide:deionized water), wherein

Amendment and Response- Under 37 C.F.R. §1.116 - Expedited Examining Procedure Page 3 of 8  
Serial No.: 09/560,268  
Confirmation No.: 2517  
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the composition has an etch rate greater than about 1000 Å/minute for cobalt at a temperature in a range of about 20 degrees centigrade to about 100 degrees centigrade.

69. **(Previously Presented)** The etching composition according to claim 68, wherein the mineral acid is HCl.

70. **(Previously Presented)** The etching composition according to claim 68, wherein the peroxide is hydrogen peroxide.

71. **(Previously Presented)** The etching composition according to claim 68, wherein the ratio is in a range of about 1:1:25 (mineral acid:peroxide:deionized water) to about 1:1:15 (mineral acid:peroxide:deionized water).

72. **(Previously Presented)** The etching composition according to claim 68, wherein the composition has an etch rate of about 50 Å/minute to about 250 Å/minute for metal nitride at a temperature in a range of about 20 degrees centigrade to about 100 degrees centigrade.

73. **(Previously Presented)** An etching composition, the composition comprising a mineral acid, a peroxide, and deionized water at a ratio in a range of about 1:1:35 (mineral acid:peroxide:deionized water) to about 1:1:15 (mineral acid:peroxide:deionized water), wherein the composition has an etch rate of about 50 Å/minute to about 250 Å/minute for metal nitride at a temperature in a range of about 20 degrees centigrade to about 100 degrees centigrade.

74. **(Previously Presented)** The etching composition according to claim 73, wherein the mineral acid is HCl.

75. **(Previously Presented)** The etching composition according to claim 73, wherein the peroxide is hydrogen peroxide.

Amendment and Response- Under 37 C.F.R. §1.116 - Expedited Examining Procedure

Page 4 of 8

Serial No.: 09/560,268

Confirmation No.: 2517

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For: COMPOSITIONS FOR SELECTIVELY ETCHING AGAINST COBALT SILICIDE (As Amended)

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76. **(Previously Presented)** The etching composition according to claim 73, wherein the ratio is in a range of about 1:1:25 (mineral acid:peroxide:deionized water) to about 1:1:15 (mineral acid:peroxide:deionized water).

77-88. **Canceled**

89. **(Previously Presented)** An etching composition, the composition consisting essentially of a mineral acid, a peroxide, and deionized water at a ratio in a range of about 1:1:35 (mineral acid:peroxide:deionized water) to about 1:1:15 (mineral acid:peroxide:deionized water), wherein the composition has an etch rate of about 50 Å/minute to about 250 Å/minute for metal nitride at a temperature in a range of about 20 degrees centigrade to about 100 degrees centigrade and an etch rate greater than about 1000 Å/minute for cobalt at a temperature in a range of about 20 degrees centigrade to about 100 degrees centigrade.

90. **(Previously Presented)** The composition according to claim 89, wherein the mineral acid is HCl and the peroxide is hydrogen peroxide.

91. **Canceled**

92. **(Previously Presented)** The composition according to claim 89, wherein the ratio is in a range of about 1:1:25 (mineral acid:peroxide:deionized water) to about 1:1:15 (mineral acid:peroxide:deionized water).

93. **(Previously Presented)** The composition according to claim 89, wherein the mineral acid is selected from the group consisting of HCl, HNO<sub>3</sub>, H<sub>2</sub>SO<sub>4</sub>, H<sub>3</sub>PO<sub>4</sub>, and HF.

94. **(Currently Amended)** An etching composition, the composition comprising a mineral acid, a peroxide, and deionized water at a ratio in a range of about 1:1:25 (mineral

**Amendment and Response- Under 37 C.F.R. §1.116 - Expedited Examining Procedure**

Page 5 of 8

Serial No.: 09/560,268

Confirmation No.: 2517

Filed: April 26, 2000

For: COMPOSITIONS FOR SELECTIVELY ETCHING AGAINST COBALT SILICIDE (As Amended)

acid:peroxide:deionized water) to about 1:1:15 (mineral acid:peroxide:deionized water), wherein the mineral acid is selected from the group consisting of HCl diluted to 37% by weight in deionized water, HNO<sub>3</sub> diluted to 70% by weight in deionized water, H<sub>2</sub>SO<sub>4</sub> diluted to 96% by weight in deionized water, H<sub>3</sub>PO<sub>4</sub> diluted to 85% by weight in deionized water, and HF diluted to 49% by weight in deionized water, wherein the peroxide is selected from the group consisting of hydrogen peroxide diluted to 29% by weight in deionized water, and ozone, and further wherein the composition has an etch rate greater than about 1000 Å/minute for cobalt at a temperature in a range of about 20 degrees centigrade to about 100 degrees centigrade.

95. **(Previously Presented)** The etching composition according to claim 94, wherein the mineral acid is HCl and the peroxide is hydrogen peroxide.

96. **Canceled**

97. **(New)** The etching composition according to claim 94, wherein the composition has an etch rate of about 50 Å/minute to about 250 Å/minute for metal nitride at a temperature in a range of about 20 degrees centigrade to about 100 degrees centigrade.

98. **(New)** An etching composition, the composition comprising a mineral acid, a peroxide, and deionized water at a ratio in a range of about 1:1:25 (mineral acid:peroxide:deionized water) to about 1:1:15 (mineral acid:peroxide:deionized water), wherein the mineral acid is selected from the group consisting of HCl diluted to 37% by weight in deionized water, HNO<sub>3</sub> diluted to 70% by weight in deionized water, H<sub>2</sub>SO<sub>4</sub> diluted to 96% by weight in deionized water, H<sub>3</sub>PO<sub>4</sub> diluted to 85% by weight in deionized water, and HF diluted to 49% by weight in deionized water, wherein the peroxide is selected from the group consisting of hydrogen peroxide diluted to 29% by weight in deionized water, and ozone, and further wherein the composition has an etch rate of about 50 Å/minute to about 250 Å/minute for metal nitride at a temperature in a range of about 20 degrees centigrade to about 100 degrees centigrade.

Amendment and Response- Under 37 C.F.R. §1.116 - Expedited Examining Procedure

Page 6 of 8

Serial No.: 09/560,268

Confirmation No.: 2517

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For: COMPOSITIONS FOR SELECTIVELY ETCHING AGAINST COBALT SILICIDE (As Amended)

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99. (New) The etching composition according to claim 98, wherein the mineral acid is HCl and the peroxide is hydrogen peroxide.

100. (New) The etching composition according to claim 64, wherein the mineral acid is selected from the group consisting of HCl diluted to 37% by weight in deionized water, HNO<sub>3</sub> diluted to 70% by weight in deionized water, H<sub>2</sub>SO<sub>4</sub> diluted to 96% by weight in deionized water, H<sub>3</sub>PO<sub>4</sub> diluted to 85% by weight in deionized water, and HF diluted to 49% by weight in deionized water, wherein the peroxide is selected from the group consisting of hydrogen peroxide diluted to 29% by weight in deionized water, and ozone.

101. (New) The etching composition according to claim 68, wherein the mineral acid is selected from the group consisting of HCl diluted to 37% by weight in deionized water, HNO<sub>3</sub> diluted to 70% by weight in deionized water, H<sub>2</sub>SO<sub>4</sub> diluted to 96% by weight in deionized water, H<sub>3</sub>PO<sub>4</sub> diluted to 85% by weight in deionized water, and HF diluted to 49% by weight in deionized water, wherein the peroxide is selected from the group consisting of hydrogen peroxide diluted to 29% by weight in deionized water, and ozone.

102. (New) The etching composition according to claim 73, wherein the mineral acid is selected from the group consisting of HCl diluted to 37% by weight in deionized water, HNO<sub>3</sub> diluted to 70% by weight in deionized water, H<sub>2</sub>SO<sub>4</sub> diluted to 96% by weight in deionized water, H<sub>3</sub>PO<sub>4</sub> diluted to 85% by weight in deionized water, and HF diluted to 49% by weight in deionized water, wherein the peroxide is selected from the group consisting of hydrogen peroxide diluted to 29% by weight in deionized water, and ozone.